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One x One Degree
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	10,850	4,189.1	3

Species Information

The columns below provide breif summaries of the species associated with the region and described in the table on the next pages. Definitions are provided in the Excel file for this region.

Genus	Species
Ash	2
Hickory	0
Maple	0
Oak	1
Pine	0
Other	3
	6

Abundance	
Abundant	0
Common	2
Rare	4
Absent	3
	9

	Model Reliability	Adaptability
High	1	1
Medium	4	5
Low	3	2
FIA	1	
	9	**8**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	0	0
No Change	2	2
Decrease	3	3
New	0	0
Unknown	4	4
	9	**9**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	0	0
Good	0	0
Fair	1	1
Poor	3	3
Very Poor	1	1
FIA Only	1	1
Unknown	3	3
	9	**9**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	2	2
Migrate	0	0
	2	**2**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	71.5	72.8	74.3	75.1
	CCSM85	71.5	73.4	75.6	78.1
	GFDL45	71.5	77.0	76.1	77.8
	GFDL85	71.5	74.4	77.8	81.6
	HAD45	71.5	73.6	76.0	76.8
	HAD85	71.5	74.2	77.0	80.4
Growing Season May—Sep	CCSM45	83.4	84.6	85.9	86.6
	CCSM85	83.4	85.3	87.3	90.0
	GFDL45	83.4	90.2	89.0	91.4
	GFDL85	83.4	87.2	90.9	95.6
	HAD45	83.4	85.6	87.7	88.3
	HAD85	83.4	86.1	89.2	92.4
Coldest Month Average	CCSM45	52.6	55.0	55.5	56.2
	CCSM85	52.6	54.6	55.7	57.0
	GFDL45	52.6	55.9	56.1	56.0
	GFDL85	52.6	53.7	54.7	55.3
	HAD45	52.6	53.6	54.8	55.3
	HAD85	52.6	55.8	57.1	58.7
Warmest Month Average	CCSM45	87.0	88.2	89.0	89.2
	CCSM85	87.0	89.1	89.7	91.0
	GFDL45	87.0	91.5	92.3	93.4
	GFDL85	87.0	91.7	93.3	96.0
	HAD45	87.0	89.5	90.4	90.8
	HAD85	87.0	90.1	91.9	93.2

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	21.5	24.8	24.1	21.4
	CCSM85	21.5	23.2	23.8	23.9
	GFDL45	21.5	19.2	22.5	16.3
	GFDL85	21.5	19.2	19.3	17.6
	HAD45	21.5	23.0	21.3	24.5
	HAD85	21.5	21.8	22.8	24.1
Growing Season May—Sep	CCSM45	11.6	13.4	12.7	11.9
	CCSM85	11.6	13.4	12.3	13.2
	GFDL45	11.6	10.0	12.5	8.7
	GFDL85	11.6	10.4	10.4	9.2
	HAD45	11.6	11.5	11.3	13.0
	HAD85	11.6	11.6	11.4	12.0

NOTE: For the six climate variables, four 30-year periods are used to indicate six potential future trajectories. The period ending in 2009 is based on modeled observations from the PRISM Climate Group and the three future periods were obtained from the NASA NEX-DCP30 dataset. Future climate projections from three models under two emission scenarios show estimates of each climate variable within the region. The three models are CCSM4, GFDL CM3, and HadGEM2-ES and the emission scenarios are the 4.5 and 8.5 RCP. The average value for the region is reported, even though locations within the region may vary substantially based on latitude, elevation, land-use, or other factors.

Cite as: Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. Forests. 10(11): 989. https://doi.org/10.3390/f10110989.

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
cedar elm	Ulmus crassifolia	NDH	Medium	7.2	57.7	35.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	1
live oak	Quercus virginiana	NDH	High	7.2	56.2	30.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	2
sugarberry	Celtis laevigata	NDH	Medium	5	7.5	8.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	3
hackberry	Celtis occidentalis	WDH	Medium	1.2	0.6	0.8	No change	No change	High	Rare	Fair	Fair			0	4
Texas ash	Fraxinus texensis	NDH	FIA	2.9	0.6	1.9	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	5
green ash	Fraxinus pennsylvanica	WSH	Low	2.9	0.5	1.8	No change	No change	Medium	Rare	Poor	Poor			0	6
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	7
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	8
white ash	Fraxinus americana	WDL	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	9